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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re U.S. Letters Patent of:	
Monz et al.	Application No.: **10/023,389**
Patent No.: **7,209,800**	Examiner: **C. Chow**
Issued: **April 24, 2007**	Art Unit: **2191**

For: **PROCESS AND SYSTEM FOR GENERATING OR VISUALIZING SETS OF CONTROL DATA**

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450
ATTENTION: Certificate of Correction Branch

CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service as First Class Mail, postage prepaid, in an envelope addressed to Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 ATTENTION: Certificate of Correction Branch on May 11, 2007.

By: Carol Prentice
CAROL PRENTICE

REQUEST FOR CERTIFICATE OF CORRECTION PURSUANT TO 37 C.F.R. §1.322

Dear Sir:

Transmitted herewith is a Certificate of Correction for U.S. Patent No. 7,209,800 which issued on April 24, 2007. Upon reviewing the patent, the patentees noted a minor typographical error in claim 5.

A Certificate of Correction is enclosed, and reads as follows:

Column 20, line 60: correct "mariner" to read -- manner --.

Enclosed is a copy of Patentees' Amendment After Allowance dated December 28, 2006 (and entered by the Examiner as reported in the Office communication (copy enclosed) dated February 22, 2007)evidencing the requested correction in claim 5.

Since the error for which a Certificate of Correction is sought was the result of a Patent and Trademark Office mistake, no fee is due (35 U.S.C. §254). The issuance of the enclosed Certificate of Correction is therefore respectfully requested.

Attached hereto, in duplicate, is Form PTO-1050, with at least one copy being suitable for printing.

Please send the Certificate to Patentees' undersigned representative.

Respectfully submitted,

Douglas M. McAllister
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ATTORNEY DOCKET NO.: HOE-466.1
Date: May 11, 2007

Response to Rule 312 Communication	Application No.	Applicant(s)
	10/023,389	MONZ ET AL.
	Examiner	Art Unit
	Chih-Ching Chow	2191

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address –

1. ☒ The amendment filed on *28 December 2006* under 37 CFR 1.312 has been considered, and has been:

   a) ☒ entered.

   b) ☐ entered as directed to matters of form not affecting the scope of the invention.

   c) ☐ disapproved because the amendment was filed after the payment of the issue fee.
   Any amendment filed after the date the issue fee is paid must be accompanied by a petition under 37 CFR 1.313(c)(1) and the required fee to withdraw the application from issue.

   d) ☐ disapproved. See explanation below.

   e) ☐ entered in part. See explanation below.

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WEI ZHEN
SUPERVISORY PATENT EXAMINER

MAY 16 2007

Chih-Ching Chow
Examiner
Art Unit: 2191

COPY

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	)	
	)	
Monz, et al.	)	Examiner: C. Chow
	)	
Serial No.: 10/023,389	)	Art Unit: 2191
	)	
Filed: December 14, 2001	)	
	)	

For: **PROCESS AND SYSTEM FOR GENERATING OR VISUALIZING SETS OF CONTROL DATA**

MAIL STOP ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first-class mail in an envelope addressed to: Mail Stop ISSUE FEE, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on: December 28, 2006.

Signature: Carol Prentice
Carol Prentice

AMENDMENT AFTER ALLOWANCE UNDER 37 C.F.R. § 1.312

AND

RESPONSE TO INTERVIEW SUMMARY

Dear Sir:

This Amendment After Allowance and Response to Interview Summary is responsive to the Notice of Allowance, Examiner's Amendment, and Interview Summary mailed on November 29, 2006, in accordance with 37 C.F.R. § 1.312.

Please amend the above-identified U.S. patent application as follows:

Amendments to the Claims are reflected in the listing of claims which begins on page 2 of this paper.

Remarks begin on page 13.

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Previously presented) A computer-implemented method for generating a control program for a machine tool, said machine tool having at least one sequence of sets of control data for the machining of a workpiece by means of operating units controlled by the control programs, comprising:

providing a machine display for presenting a visualization of a virtual workpiece and at least two virtual operating units to a user by a data processing unit, each of said virtual operating units corresponding to an operating unit of said machine tool,

addressing at least one of said virtual operating units by the user to specify virtual action(s) for said at least one virtual operating unit via a data input unit and visualizing said at least two virtual operating units and said specified virtual action(s) of said at least one virtual operating unit on said machine display to show relative movement between said at least two virtual operating units on said machine display, and

converting the action(s) specified to said at least one virtual operating unit into sets of control data of the control program by the data processing unit taking into account a machine configuration and control configuration specified to said machine tool.

2. (Previously presented) A method as defined in claim 1, wherein all of the virtual operating units of the machine tool are presented to the user in accordance with an actual machine configuration in on said machine display.

3. (Original) A method as defined in claim 2, wherein all of the virtual operating units and their virtual actions are represented, taking into account the machine and control configuration of the machine tool.

4. (Original) A method as defined in claim 1, wherein the virtual operating units and their virtual actions are represented for the user after they have been addressed and specified.

5. (Original) A method as defined in claim 1, wherein a linking of virtual operating units specified in a defined manner is carried out automatically by the data processing unit in order to take into account the machine and control configuration.

6. (Original) A method as defined in claim 1, wherein the machine and control configuration is taken into account with the aid of a machine model comprising information concerning linkings of the virtual operating units representing the machine and control configuration.

7. (Original) A method as defined in claim 6, wherein the machine model comprises a basic configuration of the virtual operating units of the machine tool extendible by the user.

8. (Original) A method as defined in claim 6, wherein the machine model is generated by means of stored linking information.

9. (Original) A method as defined in claim 6, wherein the machine model linking the individual, virtual operating units of the machine tool in accordance with the machine and control configuration is stored in the data processing unit.

10. (Original) A method as defined in claim 6, wherein the machine model is utilized in the data processing unit in the form of a data tree structure.

11. (Previously presented) A method as defined in claim 10, wherein the data tree structure has the form of a hierarchical data tree structure.

12. (Original) A method as defined in claim 1, wherein for each virtual operating unit the machining operations realizable therewith are ascertained automatically by the data processing unit.

13. (Original) A method as defined in claim 12, wherein a set of filter data is generated for ascertaining the realizable machining operation.

14. (Original) A method as defined in claim 13, wherein the set of filter data is generated on the basis of the machine and control configuration.

15. (Original) A method as defined in claim 13, wherein the set of filter data is ascertained independently by the data processing unit in accordance with the machine and control configuration.

16. (Original) A method as defined in claim 13, wherein a list of machining operations performable with the respective virtual operating unit is selected from a list of all the possible machining operations with the set of filter data.

17. (Original) A method as defined in claim 16, wherein the list with the machining operations allocated to the respective virtual operating unit is presented so as to be selectable for a user.

18. (Original) A method as defined in claim 12, wherein the sets of control data for the control program are ascertained automatically by the data processing unit on the basis of the addressed, virtual operating unit and the virtual machining operation correspondingly selected.

19. (Original) A method as defined in claim 1, wherein the change in shape of a virtual workpiece due to machining thereof is represented by means of virtual actions of the virtual operating units.

20. (Original) A method as defined in claim 19, wherein the change in shape of the virtual workpiece is ascertained by way of a cut calculation.

21. (Original) A method as defined in claim 1, wherein the sets of control data of the control program are decoded and interpolated by the data processing unit in the same way as in a decoder and an interpolator of the machine control for the operating units of the machine tool.

22. (Original) A method as defined in claim 21, wherein the virtual actions of the virtual operating units are ascertained and represented during the interpolation using the machine and control configuration.

23. (Original) A method as defined in claim 22, wherein the machine model is used during the interpolation for ascertaining the virtual actions.

24. (Original) A method as defined in claim 19, wherein the machining of the virtual workpiece is represented at any time on said virtual workpiece.

25. (Original) A method as defined in claim 1, wherein the virtual actions of the virtual operating units are visualized in a machining sequence provided for a machining of the virtual workpiece or in a reverse machining sequence.

26. (Original) A method as defined in claim 25, wherein in addition to the sets of control data, auxiliary data allowing a visualization of the virtual actions in a reverse machining sequence are generated for each set of control data taking into account the machine tool and control configuration.

27. (Original) A method as defined in claim 26, wherein the auxiliary data are allocated to each set of control data in the form of a set of auxiliary data.

28. (Original) A method as defined in claim 27, wherein the sets of auxiliary data are stored in a chained list.

29. (Original) A method as defined in claim 27, wherein the set of auxiliary data comprises a set of transition and/or status data.

30. (Original) A method as defined in claim 1, wherein shape data of the virtual workpiece are ascertained for each set of control data.

31. (Original) A method as defined in claim 30, wherein the shape data are stored in the set of auxiliary data.

32. (Original) A method as defined in claim 28, wherein not only the control program but also the chained list is accessed and the corresponding set of auxiliary data are read from the chained list for each set of control data.

33. (Original) A method as defined in claim 32, wherein not only the set of control data to be processed but also the associated set of auxiliary data are determined at the same time by the data processing unit.

34. (Original) A method as defined in claim 28, wherein the chained list is stored and a set of auxiliary data is clearly allocated to each set of control data.

35. (Original) A method as defined in claim 26, wherein sets of control data and auxiliary data are recorded with the data processing unit in machining sequence or in reverse machining sequence and represented by the virtual operating units and virtual actions.

36. (Currently amended) A ~~computer~~ computerized programming system for generating a control program to provide machining of a workpiece by means of operating units of a machine tool, comprising:

a data input unit for entering and/or changing information determining the control program of the machine tool.

a visualization device for representing said information, and

a data processing unit adapted to convert the information into sets of control data determining the control program and storing these in a program memory, wherein:

the data processing unit comprises a model visualization unit designed such that with it at least two virtual operating units of the machine tool and virtual actions of the virtual operating units are representable by means of said visualization device, each of said virtual operating units corresponding to an operating unit of said machine tool,

the model visualization unit interacting with the data input unit such that at least one of said virtual operating units is addressable via the data input unit and virtual actions are specifiable to said at least one virtual operating unit and representable by means of said visualization device, said visualization device providing a visualization of said at least two virtual operating units and said specified virtual actions of said at least one virtual operating unit to show relative movement between said at least two virtual operating units, and

with the model visualization unit the virtual actions specified to the at least one virtual operating unit are convertible into the sets of control data of the control program taking into account a machine configuration and control configuration.

37. (Original) A programming system as defined in claim 36, wherein with the model visualization unit, all of the virtual operating units of the machine tool are representable on the visualization device in the form of a machine display, in accordance with the actual machine configuration.

38. (Original) A programming system as defined in claim 36, wherein the model visualization unit represents the virtual operating units and their virtual actions on the visualization device taking into account the machine and control configuration of the machine tool.

39. (Original) A programming system as defined in claim 36, wherein the model visualization unit represents the virtual operating units and their virtual actions on the visualization device after they have been addressed and specified.

40. (Original) A programming system as defined in claim 36, wherein a linking of virtual operating units specified in a defined manner takes place by means of a model configuration unit interacting with the model visualization unit, in order to take into account the machine and control configuration.

41. (Original) A programming system as defined in claim 36, wherein the machine and control configuration is taken into account with the aid of a machine model generated by the model visualization unit, said machine model comprising information concerning linkings of the virtual operating units representing the machine and control configuration.

42. (Original) A programming system as defined in claim 41, wherein the machine model comprises a basic configuration of the virtual operating units of the machine tool extendible by the user.

43. (Original) A programming system as defined in claim 41, wherein the machine model is generatable by means of linking information from a model configuration unit.

44. (Original) A programming system as defined in claim 41, wherein the data processing unit has a main memory for storage of the machine model linking the individual, virtual operating units of the machine tool in accordance with the machine and control configuration.

45. (Original) A programming system as defined in claim 41, wherein the machine model is available to the data processing unit in the form of a data tree structure.

46. (Original) A programming system as defined in claim 45, wherein the data tree structure has the form of a hierarchical data tree structure.

47. (Original) A programming system as defined in claim 36, wherein a function allocation unit is allocated to the model visualization unit, the machining operation realizable with each virtual operating unit being ascertainable for each operating unit with said function allocation unit.

48. (Original) A programming system as defined in claim 47, wherein a set of filter data is generatable for ascertaining the realizable machining operation.

49. (Original) A programming system as defined in claim 48, wherein the set of filter data is generatable on the basis of the machine and control configuration.

50. (Original) A programming system as defined in claim 48, wherein the model configuration unit generates the set of filter data in accordance with the machine and control configuration and transmits this set of filter data to the function allocation unit.

51. (Original) A programming system as defined in claim 48, wherein with the set of filter data, the function allocation unit selects from a list of all possible machining operations a list of machining operations performable with the respective virtual operating units.

52. (Original) A programming system as defined in claim 51, wherein the function allocation unit presents the list with the machining operations allocated to the respective virtual operating units via the model visualization unit so as to be selectable for a user.

53. (Original) A programming system as defined in claim 47, wherein the model visualization unit automatically ascertains the sets of control data for the control program on the basis of the addressed operating unit and the virtual machining operation selected accordingly.

54. (Original) A programming system as defined in claim 36, wherein the model visualization unit represents the change in shape of a virtual workpiece by way of machining thereof by means of virtual actions of the virtual operating units.

55. (Original) A programming system as defined in claim 54, wherein the change in shape of the virtual workpiece is ascertainable by way of a cut calculation unit.

56. (Original) A programming system as defined in claim 36, wherein the model visualization unit has a decoder and an interpolator for the sets of control data of the control program corresponding to a decoder and an interpolator of the machine control for the operating unit of the machine tool.

57. (Original) A programming system as defined in claim 56, wherein the interpolator ascertains the virtual actions of the virtual operating units using the machine and control configuration and the model visualization unit represents these on the visualization device.

58. (Original) A programming system as defined in claim 57, wherein the interpolator is used to ascertain the virtual actions of the machine model.

59. (Original) A programming system as defined in claim 54, wherein the model visualization unit is designed such that the machining of the virtual workpiece is representable at any time on said virtual workpiece.

60. (Original) A programming system as defined in claim 36, wherein the virtual actions of the virtual operating units are visualizable in a machining sequence provided for a machining of the virtual workpiece or in a reverse machining sequence.

61. (Original) A programming system as defined in claim 60, wherein in addition to generating said sets of control data, the model visualization unit generates auxiliary data for each set of control data taking into account the machine tool and control configuration, said auxiliary data permitting a visualization of the virtual actions in a reverse machining sequence.

62. (Original) A programming system as defined in claim 61, wherein the model visualization unit allocates the auxiliary data to each set of control data in the form of a set of auxiliary data.

63. (Original) A programming system as defined in claim 62, wherein the model visualization unit stores the sets of auxiliary data in a chained list.

64. (Original) A programming system as defined in claim 62, wherein the set of auxiliary data comprises a set of transition and/or status data.

65. (Original) A programming system as defined in claim 36, wherein the model visualization unit ascertains shape data of the virtual workpiece for each set of control data.

66. (Original) A programming system as defined in claim 65, wherein the model visualization unit stores the shape data in the set of auxiliary data.

67. (Original) A programming system as defined in claim 63, wherein the model visualization unit is designed such that it accesses not only the control program but also the chained list, and the corresponding set of auxiliary data is readable from the chained list for each set of control data.

68. (Original) A programming system as defined in claim 67, wherein the model visualization unit determines by means of an indicator unit not only the set of control data to be processed, but also the associated set of auxiliary data.

69. (Original) A programming system as defined in claim 61, wherein the model visualization unit is designed such that with it sets of control data and auxiliary data are recordable in machining sequence or in reverse machining sequence and are representable by way of the virtual operating units and virtual actions.

70. (Original) A programming system as defined in claim 63, wherein the data processing unit has a system program memory for storing the control program.

71. (Original) A programming system as defined in claim 70, wherein the chained list is stored in the system program memory and that a set of auxiliary data is clearly allocated to each set of control data.

REMARKS

Summary

This Amendment and Response to Interview Summary is responsive to the Notice of Allowance, Examiner's Amendment, and Interview Summary mailed on November 29, 2006 in accordance with 37 C.F.R. § 1.312.

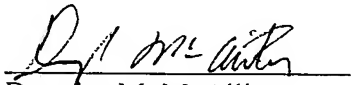
Claim 36 is amended herein.

Applicant respectfully disagrees with the substance of the October 26, 2006 interview set forth by the Examiner in the Interview Summary Form to the extent the Examiner indicates that Applicant's counsel agreed to amend the preamble of claim 36 to read "A computer programming system . . . ." Rather, Applicant's counsel agreed with the Examiner that the preamble of claim 36 could be amended to read "A computerized programming system . . . ."

The preamble of claim 36 is amended herein to correctly conform to the agreement reached between Applicant's counsel and the Examiner during the October 26, 2006 interview.

In view of the above, the Examiner is respectfully requested to enter this amendment prior to issuance of the patent. If there are any remaining issues that need to be addressed in order to place this application into condition for issuance, the Examiner is requested to telephone Applicants' undersigned attorney.

Respectfully submitted,



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Date: December 28, 2006

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U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

(Also Form PTO-1050)

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 7,209,800

APPLICATION NO.: 10/023,389

ISSUE DATE : April 24, 2007

INVENTOR(S) : Monz et al.

It is certified that an error appears or errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Column 20, line 60: correct "mariner" to read -- manner --.

MAILING ADDRESS OF SENDER (Please do not use customer number below):

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U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

(Also Form PTO-1050)

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

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